**SVM1XX-A**

X, 2009

POWERWAVE C300

For use with machine code number: **111XX**

Safety Depends on You

Lincoln arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation . . . and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And, most importantly, think before you act and be careful.
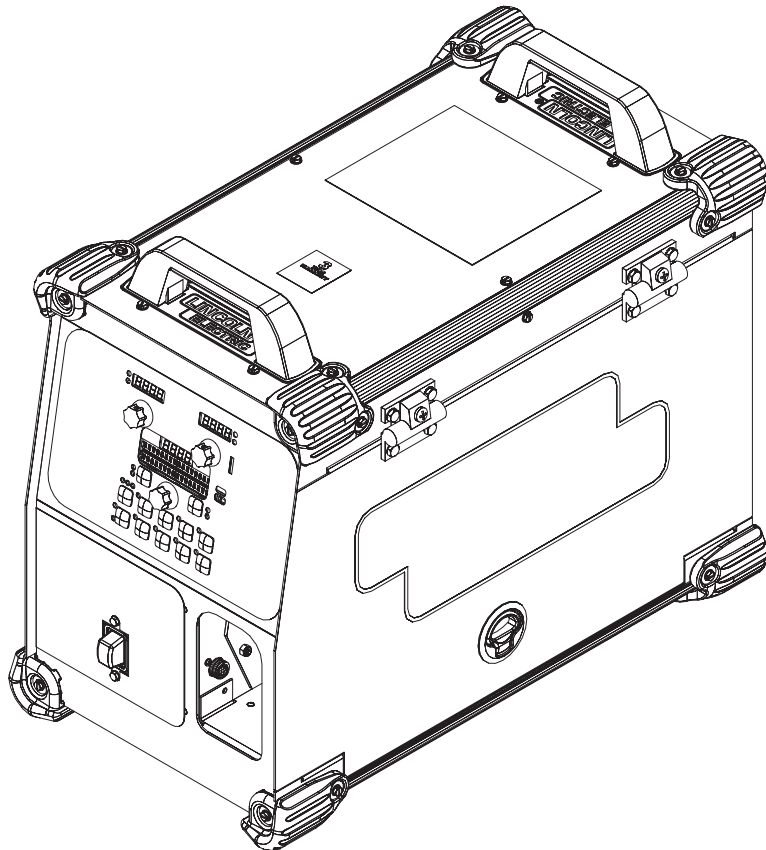
SERVICE MANUAL

LINCOLN ® ELECTRIC

• World's Leader in Welding and Cutting Products •

• Sales and Service through Subsidiaries and Distributors Worldwide •

Cleveland, Ohio 44117-1199 U.S.A.   TEL: 216.481.8100   FAX: 216.486.1751   WEB SITE: www.lincolnelectric.com

SHIELDING GAS CONNECTION

⚠ WARNING

CYLINDER may explode if damaged.

• **Keep cylinder upright and chained to support.**

• **Keep cylinder away from areas where it may be damaged.**
• **Never lift welder with cylinder attached.**
• **Never allow welding electrode to touch cylinder.**
• **Keep cylinder away from welding or other live electrical circuits.**

• **BUILD UP OF SHIELDING GAS MAY HARM HEALTH OR KILL.**
• **Shut off shielding gas supply when not in use.**

• **See American National Standard Z-49.1, "Safety in Welding and Cutting" Published by the American Welding Society.**

MAXIMUM INLET PRESSURE IS **100** PSI. **(6.9** BAR.**)**
Install the shielding gas supply as follows:

1. Secure the cylinder to prevent it from falling.

2. Remove the cylinder cap. Inspect the cylinder valves and regulator for damaged threads, dirt, dust, oil or grease. Remove dust and dirt with a clean cloth. **DO NOT ATTACH THE REGULATOR IF OIL, GREASE OR DAMAGE IS PRESENT!** Inform your gas supplier of this condition. Oil or grease in the presence of high pressure oxygen is explosive.

3. Stand to one side away from the outlet and open the cylinder valve for an instant. This blows away any dust or dirt which may have accumulated in the valve outlet.

4. Attach the flow regulator to the cylinder valve and tighten the union nut(s) securely with a wrench. Note: if connecting to 100% CO_2 cylinder, insert regulator adapter between regulator and cylinder valve. If adapter is equipped with a plastic washer, be sure it is seated for connection to the CO_2 cylinder.

5. Attach one end of the inlet hose to the outlet fitting of the flow regulator. Attach the other end to the welding system shielding gas inlet. Tighten the union nuts with a wrench.

6. Before opening the cylinder valve, turn the regulator adjusting knob counterclockwise until the adjusting spring pressure is released.

7. Standing to one side, open the cylinder valve slowly a fraction of a turn. When the cylinder pressure gage stops moving, open the valve fully.

8. The flow regulator is adjustable. Adjust it to the flow rate recommended for the procedure and process being used before making a weld.

POWER WAVE® C300's internal gas connection should be connected to wire drive's gas connection.

FIGURE A.4
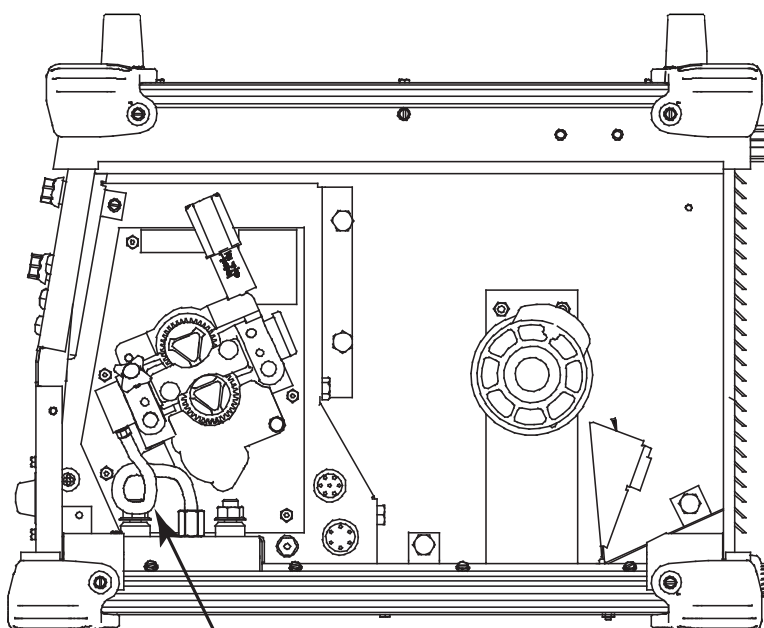
ENTERNAL GAS CONNECTION FOR GMAW PROCESS

POWERWAVE C300

LINCOLN ELECTRIC
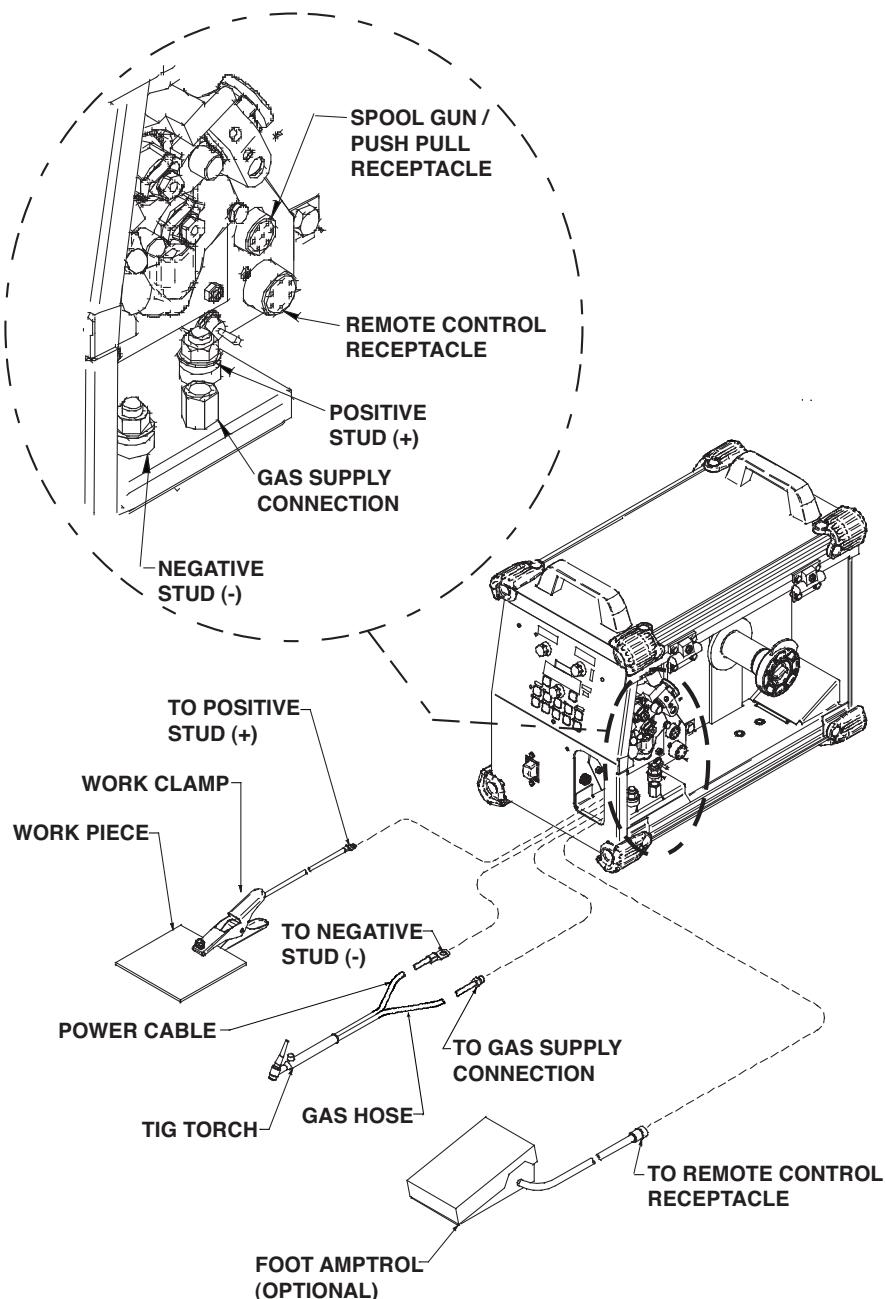
TIG WELDING

(Figure A.7)

Tig uses Electrode Negative Polarity so for this application, connect the Tig torch to the negative (-) output stud and connect the work clamp to the positive (+) output stud. The TIG torches gas connection should be connected to the POWER WAVE® C300's internal gas supply connection. If required a foot amptrol can be connected to the remote control receptacle.

SMAW WELDING

Most SMAW welding procedures use Electrode Positive welding. For these applications, connect the stick electrode holder to the positive (+) output stud and connect the work clamp to the negative (-) output stud.

Some SMAW welding procedures does use Electrode Negative Polarity. For these applications, connect the stick electrode holder to the negative (-) output stud and connect the work clamp to the positive (+) output stud.

FIGURE A.7

SPOOL GUN / PUSH PULL RECEPTACLE

REMOTE CONTROL RECEPTACLE

POSITIVE STUD (+)

GAS SUPPLY CONNECTION

NEGATIVE STUD (-)

TO POSITIVE STUD (+)

WORK CLAMP

WORK PIECE

TO NEGATIVE STUD (-)

POWER CABLE

TO GAS SUPPLY CONNECTION

TIG TORCH   GAS HOSE

TO REMOTE CONTROL RECEPTACLE

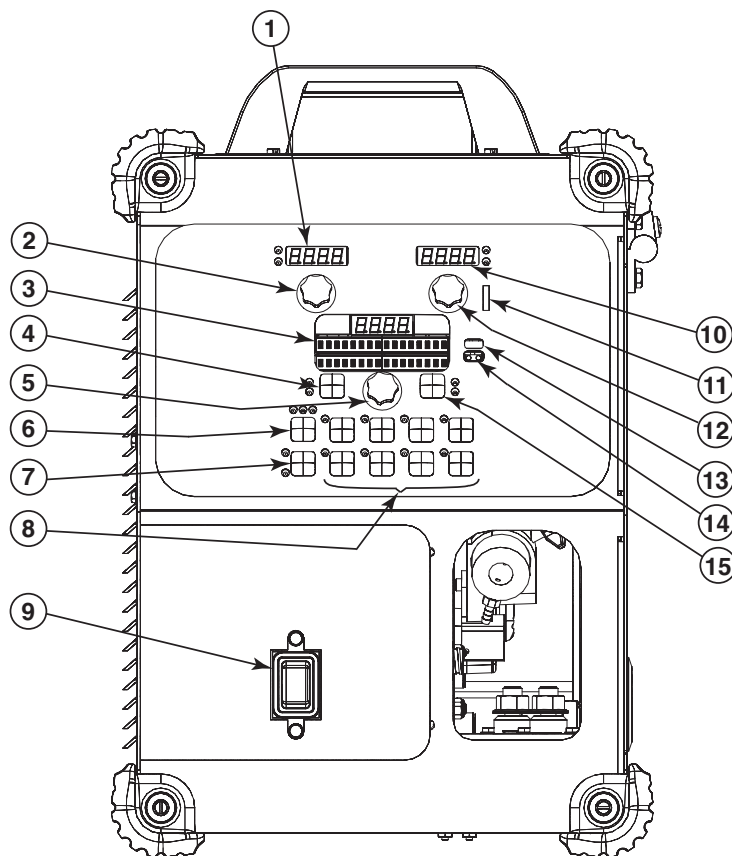FOOT AMPTROL (OPTIONAL)

POWERWAVE C300

LINCOLN® ELECTRIC

CASE FRONT CONTROLS
(Code 11479)

FIGURE B.1

All operator controls and adjustments are located on the case front of the Power Wave. **(See Figure B.1)**

1. LEFT DISPLAY- Shows wire feed speed or amperage,

2. LEFT KNOB- Adjusts value in left display.

3. MAIN DISPLAY- Shows detailed welding and diagnostic information.

4. LEFT BUTTON- Changes the Main display to show the Weld Mode or Arc Control.

5. MAIN KNOB- Changes the values on the Main display.

6. PROCEDURE BUTTON- Selects A or B procedure, or gun control.

7. 2-STEP/4-STEP BUTTON- Toggles between 2-step and 4-step trigger operation.

8. MEMORIES BUTTONS- For selection of common procedures.

9. ON/OFF SWITCH- Controls power to the Power Wave® C300.

10. RIGHT DISPLAY- Shows voltage or trim.

11. THERMAL LIGHT- Indicates when machine has thermal fault.

1**2. RIGHT KNOB**- Adjusts value in right display.

13. SET-UP- Lights when machine is in set-up mode,

14. IR PORT- Used to transfer information to palm computers, etc.

15. RIGHT BUTTON- Used to toggle start options and to end options.

OPERATION

CASE BACK CONTROLS
(Code 11479)

FIGURE B.2
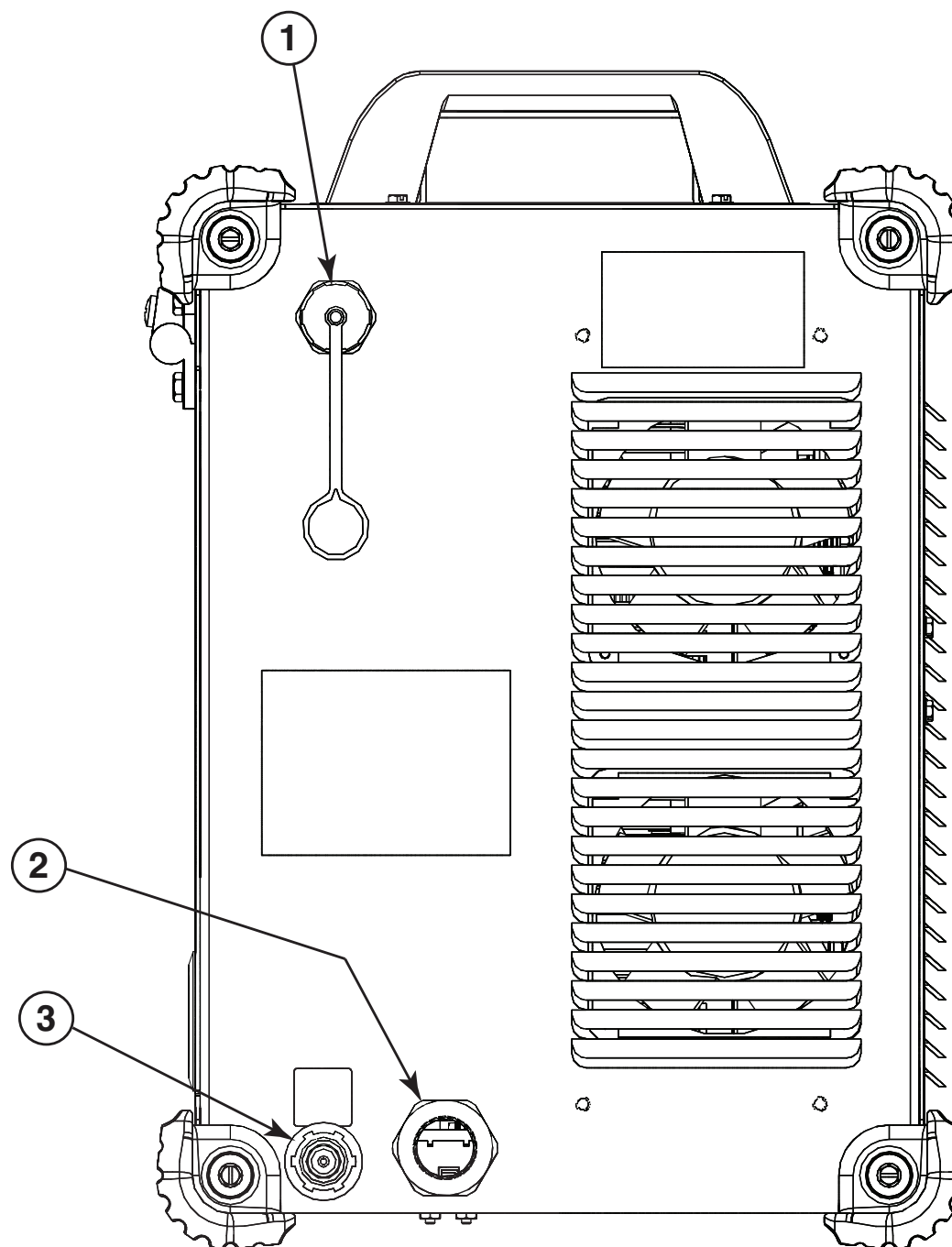
1. **ETHERNET CONNECTOR**

2. **GAS CONNECTION**

3. **POWER CORD**

POWERWAVE C300

LINCOLN ELECTRIC

INTERNAL CONTROLS
(Code 11479)

FIGURE B.3
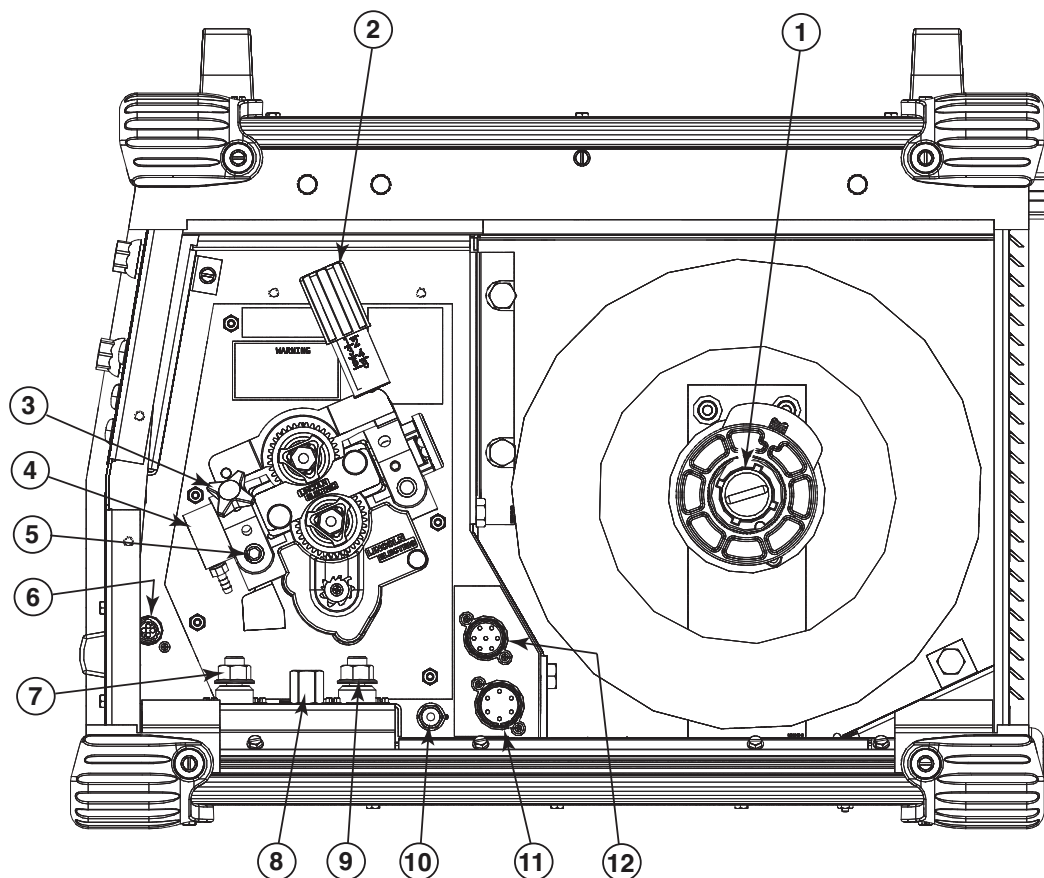
1. SPINDLE BRAKE

2. WIRE DRIVE PRESSURE ARM

3. THUMB SCREW, FOR SECURING THE WELDING GUN

4. GUN BUSHING

5. SOCKET HEAD CAP SCREW FOR SECURING THE GUN BUSHING

6. 4-PIN TRIGGER RECEPTACLE

7. POSITIVE STUD

8. GAS CONNECTION

9. NEGATIVE STUD

10. COLD INCH / GAS PURGE SWITCH

11. 6-PIN CONNECTOR FOR REMOTE CONTROL OPTIONS

12. 7-PIN CONNECTOR FOR PUSH / PULL OR SPOOL GUN OPTIONS

CASE FRONT CONTROLS USED
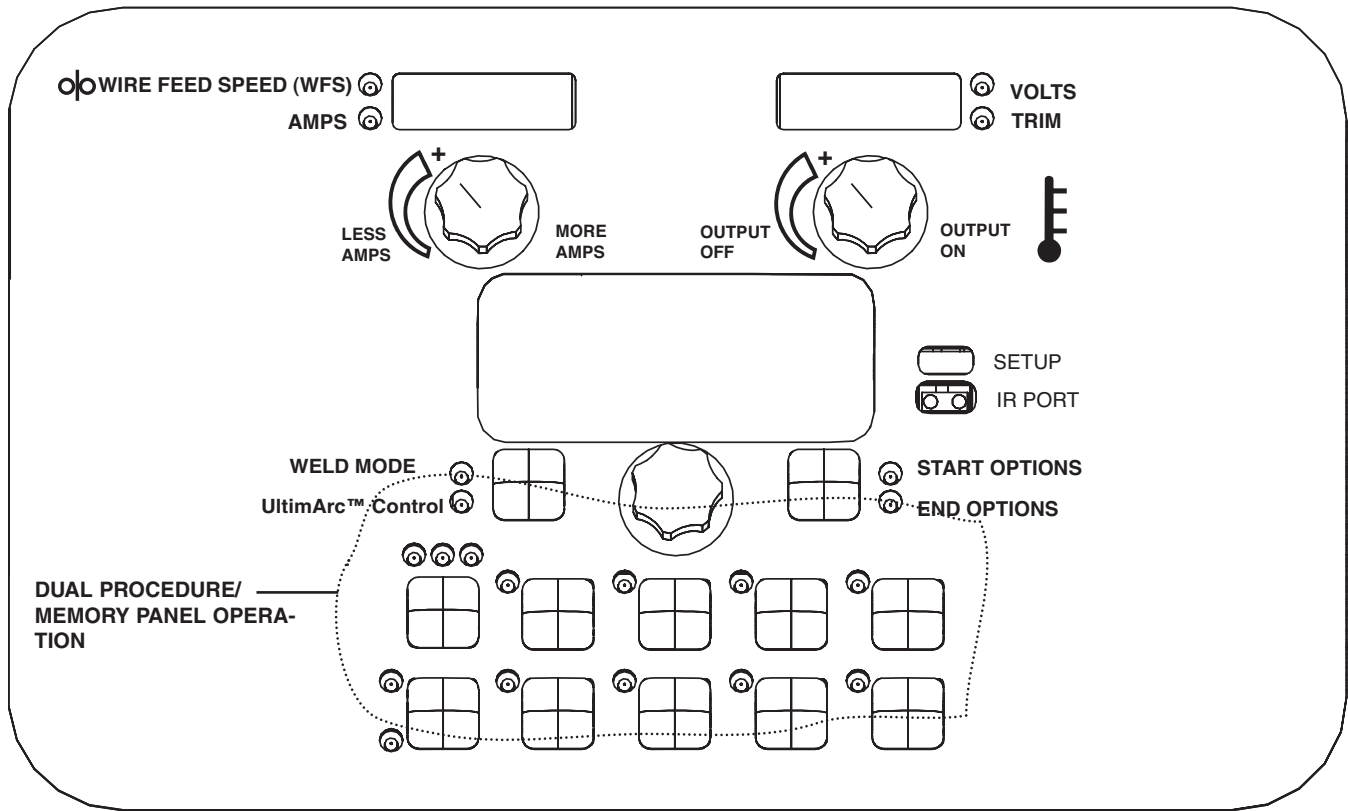
ALUMINUM SYNERGIC GMAW-P (PULSED MIG)AND GMAW-PP (PULSE ON PULSE) WELDING

The Power Wave® C300 can produce top quality aluminum welds with excellent appearance, little spatter and good bead shape. Push-pull guns are available for consistent feeding when welding a long distance away from the wire feeder.

PULSE-ON-PULSE WELDING

The Power Wave system offers both traditional pulse and Pulse-on-Pulse™. Pulse-on-Pulse (GMAW-PP) is an exclusive waveform for aluminum welding. Use it to make welds with a "stacked dime" appearance, similar to GTAW welds.(See Figure B.7)

FIGURE B.7

The pulsing frequency is adjustable. Changing the frequency modulation (or arc control) of the waveform changes the ripple spacing. Faster travel speeds may be achieved by using higher values of frequency modulation. (See Figure B.8 and B.9p)

FIGURE B.8
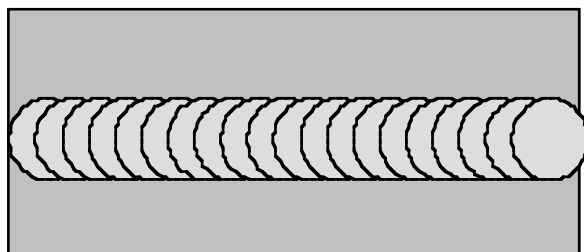
Frequency Modulation = -10
Wide weld and ripple spacing, slow travel speed.

FIGURE B.9
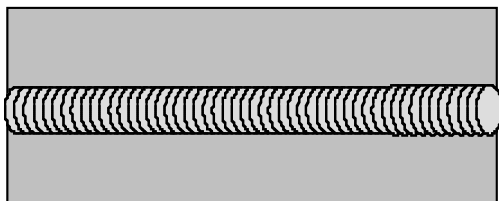
Frequency Modulation = 10
Narrow weld and ripple spacing, fast travel speed.

ALUMINUM GMAW-P AND GMAW-PP

ALUMINUM PULSE WELDING

Synergic GMAW-P (Pulsed MIG) welding is ideal for low spatter, out of position and reduced heat input applications. During pulse welding, the welding current continuously switches from a low level to a high level and then back again. Each pulse sends a small droplet of molten metal from the wire to the weld puddle.

Pulse welding controls the arc length with **'Trim'** instead of voltage. When trim (arc length) is adjusted, the Power Wave automatically recalculates the voltage, current and time of each part of the pulse waveform for the best result. Trim adjusts the arc length and ranges from 0.50 to 1.50, with a nominal value of 1.00 for a 3/4" (19mm) electrode stick-out. Trim values greater than 1.00 increase the arc length, while values less than 1.00 decrease the arc length.
(See Figure B.10)

FIGURE B.10

Trim .50   Trim 1.00   Trim 1.50
Arc Length Short   Arc Length Medium   Arc Length Long

If the passcode does not equal zero (0000), enter the passcode now. If the passcode has been forgotten, a p.c. computer application or Palm O.S. application is required to change the passcode.

Memory Value   **Low Limit**

High Limit

200
HI = 200   LO = 180
WELD WFS

SETUP
IR PORT

WELD MODE
UltimArc™ Control

START OPTIONS
END OPTIONS

Parameter Name

If the passcode has been set to zero (0000), SETUP will illuminate on the MSP4 panel and the display will show the following:

Four items show on the MSP4 panel.
   • Memory Value
   • High Limit
   • Low Limit
   • Parameter Name
One of these items will flash to indicate which item will change when the MSP4 encoder is rotated.   Press the right button on the MSP4 panel to select the item to change.

200
HI = 200   LO = 180
WELD WFS

SETUP
IR PORT

WELD MODE
UltimArc™ Control

START OPTIONS
END OPTIONS

Rotate to Change Value.

Press to select item to change.

The Limits Setup menu shows a list of all parameters available for the weld mode stored in the memory chosen. For example, if limits are being set for a stick (SMAW) mode, parameters such as Run-in WFS and Postflow will not appear.

To lock a parameter to a specific value that cannot be changed, set the high and low limits to the same value.

The memory value must always be less than or equal to the high limit, and greater than or equal to the low limit.

After setting limits, press the memory button with the flashing LED. The MSP4 will ask to save or discard the limit changes just made. Press the left MSP4 for button (YES) to save and enable the limits and exit. Press the right MSP4 button (NO) to exit and leave limits unchanged.

Enabling/Disabling Limits

Enable/Disable Limits: Press 10 seconds

A GUN B

1   2   3   4

5   6   7   8

Limits for each memory may be enabled or disabled by pressing and hold the appropriate memory button for 10 seconds. Release the memory button when the MSP4 display shows the following:

MEMORY 2   LIMITS
ENABLE / DISABLE

SETUP
IR PORT

WELD MODE
UltimArc™ Control

START OPTIONS
END OPTIONS

If the passcode does not equal zero, enter the passcode now.   If the passcode is zero (0000), SETUP will light and the MSP4 displays the following:

ENABLE   LIMITS?
Yes   No

SETUP
IR PORT

WELD MODE
UltimArc™ Control

START OPTIONS
END OPTIONS

Press the left MSP4 button (YES) to enable limits or the right MSP4 button (NO) to disable limits. Disabling limits does not change any limits values that may have been previously set.